

# Summary of work done

C.Y. Tan  
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# Status of PSP projects

MachineStu	Description	People	Status
Pre-Acc	Improve neutralization in LEBT with N or Xe.	Kiyomi/Dan/ Pat	To be continued in 2021
Pre-Acc	Penning source removed from test stand. Normal magnetron installed.	Dan/Pat/Daniel	Training postdoc, Daniel
Pre-Acc	Laser collimator laser cavity replaced with new flange design	Dave	Replaced on 21 Jan 2021
Pre-Acc/Linac	Simulation of PreAcc + Linac	Valeriy/Kiyomi/Dan	Permanent magnets being considered.
Linac	Klystron testing	Kiyomi	Changed firing circuit. Testing to start this week.
Booster	Flat injection porch	Kiyomi/Bill/George/ Howie/Chris	To be continued in 2021
Booster	Lattice studies	Jeff/John J	Meeting on 09 Jan 2021. Jeff discovered he swapped (horz, vert) data from IPM . Now results make sense. Looks like horz scraping. Eliana joined effort.
Booster	Adiabatic capture/RF phase measurements	Chandra/Tan	Confirmed very odd phase results. Trying to figure this out ...
Booster	2 <sup>nd</sup> harmonic	Robyn/Tan	Drafter from TD assigned to work on drawing
Booster	Wide bore cavity	John/Robyn	Modifications to tuner decided. End ferrites to be removed and replaced with Al rings.
Booster	2 stage collimators	Valeriy/Chandra	Meeting to be called to discuss modifications
Booster	Injection girder and injector civil construction to Booster	Dave/Salah/ Tan	E4R test stand install continues. Civil construction: company will start drawings in Jan 2021.
Booster	Garnet loss improvements	Robyn/Tan/Louri/ Gennady	Garnet type A received. Winding of solenoids of test fixture at TD.
Booster	Mode 2 & new longitudinal dampers	Bill/Nathan	PIPII review end of Feb? Bill still needs to look at mode 2.
LLRF	GMPS machine learning (get rid of reference magnet)	Bill/Brian/Kiyomi	Firmware work continues. Gathering data for ML. Waiting for chassis.
LLRF	Phase feedback, radial feedback	Brian/Ed/Bill/Tan/ Valeri/Craig	Work continues. Hardware continues to be built. Firmware being programmed. Theory of LLRF being worked on.

# Task force updates

- RF phasing experiments show a possible problem.
  - Studies confirm previous measurements (20 Jan 2021).
  - There may be a fundamental flaw in our assumptions.
- Transition crossing – group was formed. Led by Chandra.
- Injection girder
  - Talked to Dan Wolf and Howie Pfeffer, we will have to do a SPICE calculation as to whether there will be an “imbalance” (transmission line modes) that will shake the beam because of the addition of 4 D magnets that are not identical to the D magnets in Booster. (30 and 31 Oct 2019)
  - Absorber review (20 Nov 2019) <https://indico.fnal.gov/event/22416/>
- Magnet girder tests
  - E4R test stand installation will continue in 2021.
- 20 Hz infrastructure
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# Task force updates (cont'd)

- Tall aperture gradient extraction magnets
  - See injection girder about the problem with GMPS with non-identical D magnets.
  - Calculation for gap size first pass says about +/- 5 mm required. However, needs benchmarking with current operations.
- 20 Hz cavity tests
  - Report is being written. Status?
- 50 kV in situ cavity test. Required for PIP-II
  - Plan is to run continue some cavities at 50 kV once we are back to regular HEP running.
- BTL to L11 changes
  - Addition of collimators into the transfer line. Booster style 2 stage in BTL line.